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IMPROVEMENT OF THE REVOLVING CHAIR OF THE  
GUT-Co-400 INSTALLATION

- USSR -

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# IMPROVEMENT OF THE REVOLVING CHAIR OF THE GUT-Co-400 INSTALLATION

Following is a translation of an article written by I. A. Pereslegin, I. I. Kornev, and I. M. Parshin in Vestnik Rentgenologii i Radiologii (Herald of Roentgenology and Radiology), Vol. 35, No. 1, Moscow, January 1960, pages 50-51.

From the Radiological Section (Head -- Prof. A. V. Kozlova) and the Experimental Shops (Director -- D. S. Zhukhanenko) of the State Scientific Research Roentgeno-Radiological Institute (Director -- Docent I. G. Lagunova) of the Ministry of Health RSFSR.

The most effective method of radiation therapy in deeply localized tumors is rotational radiation therapy. Various comparatively complex and expensive pieces of apparatus, providing rotation of the source of irradiation around the immobile patient, are used for this purpose. The same result can be obtained by irradiating the patient, seated on a revolving armchair, while the source of irradiation remains immobile. Such a chair causes the patient to revolve and makes it possible to have the tumor located at the longitudinal axis of rotation. Naturally, such an arm-chair should provide strict fixation of the patient at the time of centering and irradiation.

An arm-chair for rotational irradiation (Fig. 1) has been designed at the Roentgeno-Radiological Institute of the Ministry of Health RSFSR (by D. S. Mitkevich) and introduced into practice; it has a fixating adaptation in the form of a back, consisting of two metallic posts and a wooden crosspiece (or one made of organic glass), located at an angle of  $\angle 15^\circ$ . At the front of the back special elbow-rests are attached for fixing the arms of the patient. The experience of the radiological section of the institute has shown that this does not ensure a strong fixation of the patient at the time of irradiation, which lasts up to 30 minutes with tumors localized intrathoracically. The weak rigidity of the attachment of the posts of the back of the arm-chair as well as its location at an angle of  $\angle 15^\circ$  does not provide a strictly longitudinal position of the

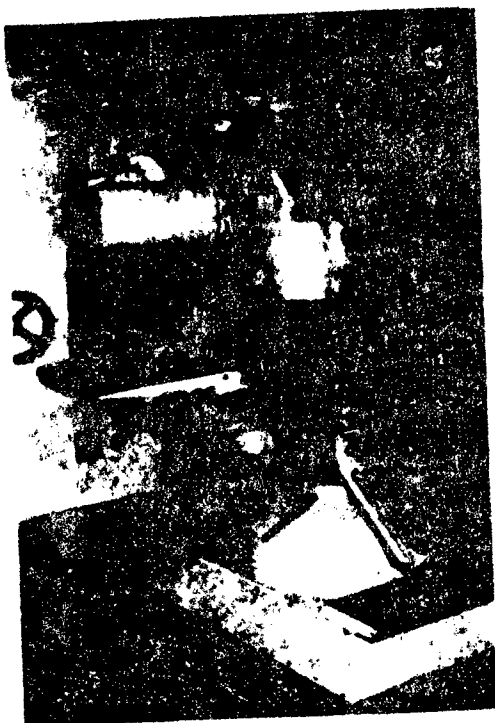


Fig. 1

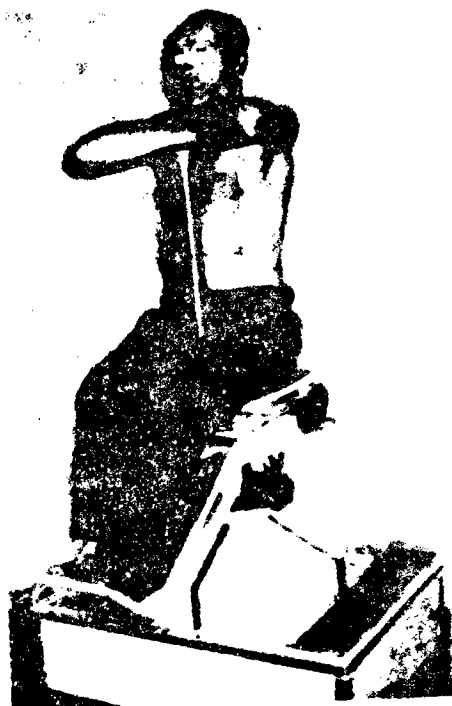


Fig. 2

patient. In addition, patients, when leaning against the back sway it, as a consequence of which the position of the patient in relation to the bundle of rays is changed. The elbow-rests, which are located in front, present in relation to the posts nothing else than a lever. The patients, having no other support, become tired in the presence of prolonged irradiation and, leaning upon the elbow-rests, which represent a lever, displace the body anteriorly, a circumstance which also disturbs the position of the patient and leads to a displacement of the pathological focus in relation to the axis of rotation. In addition, the presence of many metallic parts causes a shady reflection on the X-ray screen, which hampers the orientation of the physician during centering. The defects presented above impelled us to work out and introduce into practice a more suitable rotational platform with an anterior support for the patient, a variant of which was prepared in the experimental shops of the Roentgeno-Radiological Institute (I. M. Parshin). In front of the seat is attached a flange with a metallic rod three centimeters in diameter pressed into it. Freely displaced along this flange is a hollow upright of large diameter of laminated insulation, to which is attached a plate 20 x 30 cm made of organic glass with divisions marked on it which, according to markings previously marked on the skin of the patient corresponding to the projection of the tumor, show the height at which the tumors are located. The patients are seated on this platform (Fig. 2) and, when leaning on the plank, are no longer able to bend or incline the body. Such a position does not lead to fatigue in the patient during irradiation.

Verification of the position of the patient before and after treatment showed an unchanged location of the irradiated region on the axis of rotation of the platform. In addition, the proposed variant makes it possible to shorten by 10 cm the distance from the source of radiation to the focus, thereby increasing the absolute focal dose and diminishing the time of irradiation.

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